CLAIMS:

1. A method for decreasing the environmental release of halogen while regenerating catalyst particles, the method comprising:

   a) withdrawing a catalyst bed effluent stream comprising halogen from a catalyst bed, wherein the catalyst bed contains catalyst particles containing halogen;

   b) passing a first portion of the catalyst bed effluent stream comprising halogen to the catalyst bed, and at least partially regenerating at least a portion of the catalyst particles in the catalyst bed and removing at least a portion of the halogen from the catalyst particles in the catalyst bed;

   c) contacting a second portion of the catalyst bed effluent stream comprising halogen with adsorbent in a first adsorbent bed, removing halogen from the second portion of the catalyst bed effluent stream, and withdrawing from the first adsorbent bed a first adsorbent bed effluent stream;

   d) contacting an adsorbent bed inlet stream with adsorbent in a second adsorbent bed, the adsorbent in the second adsorbent bed containing halogen, removing halogen from the adsorbent in the second adsorbent bed, and withdrawing from the second adsorbent bed a second adsorbent bed effluent stream comprising halogen;

   e) passing at least a portion of the second adsorbent bed effluent stream comprising halogen to the catalyst bed; and

   f) at least intermittently moving catalyst particles through the catalyst bed by withdrawing catalyst particles from the catalyst bed and adding catalyst particles to the catalyst bed.

2. The method of Claim 1 further characterized in that the passing of the at least a portion of the second adsorbent bed effluent stream to the catalyst bed comprises combining the at least a portion of the second adsorbent bed effluent stream with the first portion of the catalyst bed effluent stream to form a

combined stream, and the passing of the first portion of the catalyst bed effluent stream to the catalyst bed comprises passing at least a portion of the combined stream to the catalyst bed.

3. The method of Claim 2 further characterized in that the adsorbent bed inlet stream comprises a first portion of the combined stream, and the passing of at least a portion of the combined stream to the catalyst bed comprises passing a second portion of the combined stream to the catalyst bed.

4. The method of Claim 1 further characterized in that the adsorbent bed inlet stream comprises a gas selected from the group consisting of air, oxygen, nitrogen, and mixtures thereof.

5. The method of Claim 1 further characterized in that the at least partially regenerating of at least a portion of the catalyst particles comprises a regeneration step selected from the group consisting of removing coke from catalyst particles, adding halogen to catalyst particles, redispersing metal on catalyst particles, oxidizing metal on catalyst particles, drying catalyst particles, and reducing metal on catalyst particles.

6. The method of Claim 1 further characterized in that the functions of the first adsorbent bed and the second adsorbent bed are at least intermittently shifted by operating the first adsorbent bed to function as the second adsorbent bed and operating the second adsorbent bed to function as the first adsorbent bed.

7. The method of Claim 1 wherein the halogen is chlorine or fluorine.

8. The method of Claim 1 wherein the catalyst bed effluent stream comprises a molecule selected from the group consisting of hydrogen chloride and molecular chlorine.

9. The method of Claim 1 wherein the adsorbent in the first adsorbent bed and the adsorbent in the second adsorbent bed are selected from the group consisting of a molecular sieve, silica gel, carbon, and alumina.

10. The method of Claim 1 wherein the catalyst particles comprise a catalyst selected from the group consisting of a reforming catalyst, an isomerization catalyst, and a dehydrogenation catalyst.

11. A method for decreasing the environmental release of a halogen from a process for regenerating catalyst particles, the method comprising:

a) withdrawing a first catalyst bed effluent stream comprising halogen from a first catalyst bed, wherein the first catalyst bed contains catalyst particles containing halogen;

b) passing a first portion of the first catalyst bed effluent stream comprising halogen to the first catalyst bed, and at least partially regenerating at least a portion of the catalyst particles in the first catalyst bed and removing at least a portion of the halogen from the catalyst particles in the first catalyst bed;

c) passing a catalyst bed inlet stream comprising halogen to a second catalyst bed containing catalyst particles, and at least partially regenerating at least a portion of the catalyst particles in the second catalyst bed;

d) contacting a second portion of the first catalyst bed effluent stream comprising halogen with adsorbent in a first adsorbent bed, removing halogen from the second portion of the first catalyst bed effluent stream, and withdrawing from the first adsorbent bed a first adsorbent bed effluent stream;

e) contacting an adsorbent bed inlet stream with adsorbent in a second adsorbent bed, the adsorbent in the second adsorbent bed containing halogen, removing halogen from the adsorbent in the second adsorbent bed, and withdrawing from the second adsorbent bed a second adsorbent bed effluent stream comprising halogen;

f) passing at least a portion of the second adsorbent bed effluent stream comprising halogen to at least one of the first catalyst bed and the second catalyst bed; and

g) at least intermittently moving catalyst particles through the first catalyst bed by withdrawing catalyst particles from the first catalyst bed and adding catalyst particles to the first catalyst bed.

12. The method of Claim 11 wherein the at least a portion of the second adsorbent bed effluent stream passes to the second catalyst bed.

13. The method of Claim 12 further characterized in that the passing of at least a portion of the second adsorbent bed effluent stream to the second catalyst bed comprises combining the at least a portion of the second adsorbent bed effluent stream with the catalyst bed inlet stream to form a combined stream, and the passing of the catalyst bed inlet stream to the second catalyst bed comprises passing at least a portion of the combined stream to the second catalyst bed.

14. The method of Claim 11 further characterized in that a second catalyst bed outlet stream is withdrawn from the second catalyst bed and the adsorbent bed inlet stream is formed from at least a portion of the second catalyst bed outlet stream.

15. The method of Claim 11 further characterized in that catalyst particles are moved at least intermittently through the second catalyst bed by withdrawing catalyst particles from the second catalyst bed and passing catalyst particles withdrawn from the first catalyst bed to the second catalyst bed.

16. A method for reducing chloride emissions of a catalyst regeneration zone, the method comprising:

a) withdrawing a coke combustion bed effluent stream comprising chloride from a coke combustion catalyst bed in a regeneration zone, the coke combustion catalyst bed containing catalyst particles, the catalyst particles having coke deposits thereon and containing chloride;

b) passing a first portion of the coke combustion bed effluent stream comprising chloride to the coke combustion catalyst bed, removing at least a portion of the coke deposits from catalyst particles and removing at least a portion of the chloride from catalyst particles in the coke combustion catalyst bed, the coke combustion catalyst bed operating at a gas inlet temperature of from about 316 to about 649°C.

c) withdrawing a second portion of the coke combustion bed effluent stream comprising chloride from the regeneration zone, contacting at

least a portion of the second portion of the coke combustion bed effluent stream with adsorbent in a first adsorbent bed, the first adsorbent bed operating at an adsorption temperature of from about 66 to about 482°C, removing chloride from the at least a portion of the second portion of the coke combustion bed effluent stream, and withdrawing from the first adsorbent bed a first adsorbent bed effluent stream;

d) contacting an adsorbent bed inlet stream with adsorbent in a second adsorbent bed, the adsorbent in the second adsorbent bed containing chloride, removing chloride from adsorbent in the second adsorbent bed, the second adsorbent bed operating at a temperature of more than about 55°C higher than the adsorption temperature, and withdrawing from the second adsorbent bed a second adsorbent bed effluent stream comprising chloride;

e) passing at least a portion of the second adsorbent bed effluent stream comprising chloride to the regeneration zone; and

f) at least intermittently moving catalyst particles through the coke combustion catalyst bed by withdrawing catalyst particles from the coke combustion catalyst bed and adding catalyst particles to the coke combustion bed.

17. The method of Claim 16 wherein the regeneration zone comprises at least one bed of catalyst particles selected from the group consisting of a chlorination catalyst bed, redispersion catalyst bed, oxidation catalyst bed, drying catalyst bed, and reduction catalyst bed.

18. The method of Claim 16 further characterized in that the regeneration zone comprises a chlorination catalyst bed containing catalyst particles, the at least a portion of the second adsorbent bed effluent stream passes to the chlorination catalyst bed, and chloride is added to at least a portion of the catalyst particles in the chlorination catalyst bed, the chlorination catalyst bed operating at a gas inlet temperature of from about 370 to about 650°C.

19. The method of Claim 16 further characterized in that the regeneration zone comprises a drying catalyst bed containing catalyst particles, the at least a portion of the second adsorbent bed effluent stream passes to the drying catalyst bed, water is removed from at least a portion of the catalyst particles in the drying catalyst bed and chloride is added to at least a portion of the catalyst particles in the drying catalyst bed, the drying catalyst bed operating at a gas inlet temperature of from about 425 to about 650°C.

20. The method of Claim 16 further characterized in that the functions of the first adsorbent bed and the second adsorbent bed are at least intermittently shifted by operating the first adsorbent bed to function as the second adsorbent bed and operating the second adsorbent bed to function as the first adsorbent bed, the adsorbent in the first adsorbent bed has an initial chloride content based on the weight of the adsorbent in the first adsorbent bed prior to the contacting and removal in (c), the adsorbent in the first adsorbent bed has a final chloride content based on the weight of the adsorbent in the first adsorbent bed after the contacting and removal in (c) and prior to the operating of the first adsorbent bed to function as the second adsorbent bed, and the difference between the final chloride content and the initial chloride content is from about 0.05 to about 4.0 wt-% chloride.

21. The method of Claim 16 further characterized in that the first adsorbent bed operates at adsorption conditions comprising an adsorption temperature and an adsorption molar ratio of water to halogen, the second adsorbent bed operates at desorption conditions comprising a desorption temperature and a desorption molar ratio of water to halogen, the difference between the desorption temperature and the adsorption temperature is more than about 55°C, and the ratio of the adsorption molar ratio to the desorption molar ratio is from about 0 to about 2.